

The Development Status of Environmental Monitoring and Data Analysis for SITES

Bong-Yo Yun, Keun Joo Lee, Se-Moon Park and Chang-Lak Kim
Nuclear Environment Technology Institute, Korea Hydro & Nuclear Power Co. Ltd.
P.O.Box 149, Yuseong, Daejeon, Korea 305-600, E-mail: bongyo@khnp.co.kr

1. Introduction

Site Information and Total Environmental database management System (SITES) has been developed for the purpose of effective management of the environmental and site information of the radioactive waste management site. During the operation of the disposal site and after its closure, ceaseless monitoring is needed in its safety for the institutional period of time (300 years) under the regulation's demand. SITES is an integrated program for overall data analysis, environmental monitoring, and safety analysis that are produced from the site investigation and environmental assessment of the relevant nuclear facility [1, 3]. SITES is composed of three main modules such as Site Environment Characterization database for Unified and Reliable Evaluation system (SECURE), Safety Assessment INTEgration system (SAINT) and Site Useful Data Analysis and ALarm system (SUDAL). The present paper is to introduce development status environmental monitoring and data analysis of SUDAL. [3]

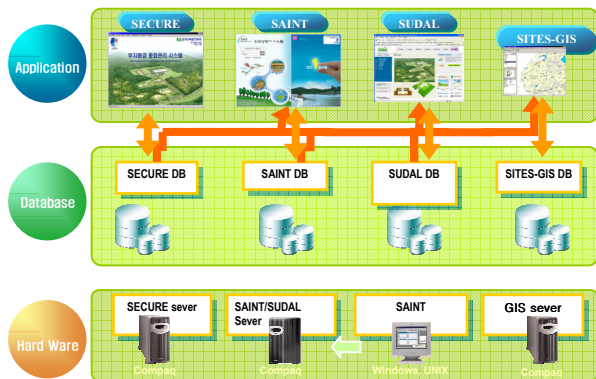


Fig.1 Systematic Diagram of SITES Composition

2. The Development of Status and function of SUDAL

SUDAL is developed for the purpose of the real time monitoring, data analysis, statistics, prediction and automatic alarming of the radioactive waste repository in its environment and its facility through pre-operation, operation and after closure period. [3]

2.1 The System Structure of SUDAL

SUDAL is developed with several sub-modules having a function to meet the above requirement. Six

sub-modules such as data collection, real time environmental monitoring, SECURE relational module, assessment and automatic alarming, data process, and GIS relational module are the main functional systems in SUDAL. [3] SUDAL will be one of the most important systems in the SITES application. This can be a tool for enhancement of the public confidence. The compositional structure of SUDAL is as shown in Figure 2. Six sub-modules are described in their functions as follows. On the other hand, Internet homepage of SUDAL is developed for public acceptance about radioactive waste reposition. It is ready to open to the public for offering them relevant information.

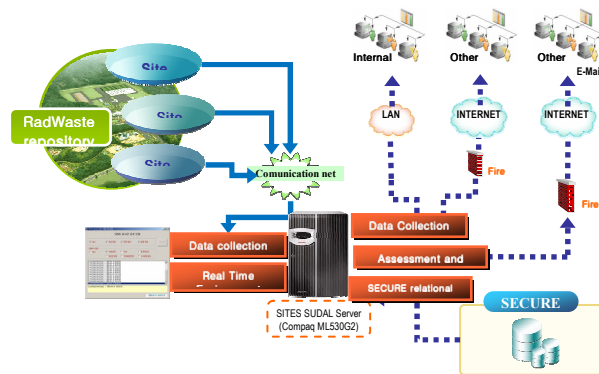


Fig. 2 The Structure diagram of SUDAL

2.2 The Development status of SUDAL.

SUDAL is operated under Windows environment and Web based for user's easy accessibility. The user of SUDAL can access by relatively their authority which is determined by supervisor of SUDAL. Meanwhile, Environmental monitoring data of site from measuring instrument can be easily searched on the digital map of repository as in fig.2. And these monitoring data is used for comparison with safety assessment result from SAINT. It will enhance the understanding and usefulness of the monitoring result.

The environmental monitoring using SUDAL is performed at divided two zones like inter and outer EAB. Also monitoring data are classified into radioactive and general environmental monitoring. In case of former, the monitoring item and period are determined from Atomic Energy Act. And the Later is done from Environment Act.

The performance of data collection is distinguished real time monitoring and periodic manual collection in SUDAL. The collected data are managed by data processing module. Using that module, every data can be used for making out periodic environmental monitoring report.

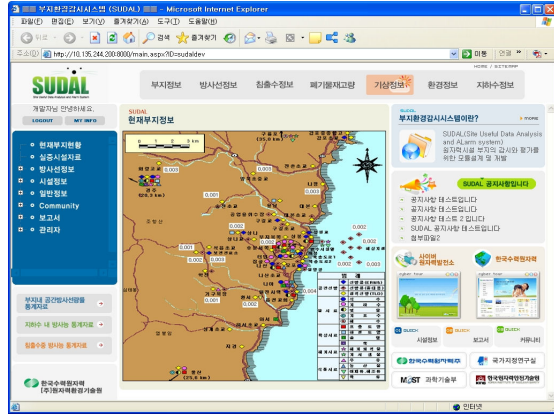


Fig.3 Description of monitoring result at the main picture of SUDAL

3. Conclusion

SUDAL is the first environmental monitoring system for radioactive waste repository. Using this system, we can control systematically enormous environmental data of repository during more than 300 years. Currently SUDAL is used for collecting pre-construction environmental data of repository site. And we prepare to present information of repository for public through Internet Homepage of SUDAL.

ACKNOWLEDGMENTS

This project has been carried out under the National Research Laboratory (NRL) Program supported by Ministry of Science and Technology (MOST), Korea.

REFERENCES

[1] S. M. Park, C. G. Rhee, J. B. Park, H. J. Lee, and C. L. Kim, "Database Modeling of the Site and Environmental Information for a Radioactive Waste Repository", *Journal of the Korean Nuclear Society*, **Vol. 36**, No. 3, pp. 263-275, (June 2004).

[2] Do Young Ko, Se-Moon Park and Chang-Lak Kim, "A Study on the Design of SEMS Module for SITES Development", *J. of the Korean Radioactive Waste Society*, **Vol.2(4)**, pp. 263-269(Dec. 2004).

[3] Se-Moon Park, Bong Yo Yoon, Dae Jung Kim, and Chang-Lak Kim, "A Study on Development of Monitoring & Assessment Module for SITES", *An*

International Journal of the Korean Nuclear Society, **Vol. 38**, No. 4. (will be published in Aug. 2006).

[4] Waterloo Hydrogeologic Inc. "Visual MODFLOW User's Manual", p.311, 2000.

[5] L. J. Hartley, C. P. Jackson and S. P. Watson, "NAMMU (Release 6.3) User Guide", AEA-ES-0138, AEA Technology, Harwell UK, 1996

[6] Korea Hydro & Nuclear Power Co., Ltd., "User's Manual for SAGE and QUARK", 2004-Env-B23 (in Korean), Radwaste Disposal Research Group, Nuclear Environment Technology Institute, Aug. 2004.

[7] Jin Beak Park, Joo Wan Park, Chang Lak Kim, Daisuke Kawasaki and Joonhong Ahn, "Safety Assessment Codes for the Near-Surface Disposal of Low and Intermediate-Level Radioactive Waste with the Compartment Model: SAGE and VR-KHNP," *Waste Management '05*, Feb. 27-Mar. 3, Tucson, Arizona /2005.

[8] Quintessa Limited, "AMBER Version 4.4 Reference Guide, Version 1.01e," Henley-on-Thames, UK, 2003.